

Appendix E

Supporting Data

2011 SBOO Stations

Demersal Fishes and Megabenthic Invertebrates

Appendix E.1

Summary of demersal fish species captured during 2011 at SBOO trawl stations. Data are number of fish (*n*), biomass (BM, wet weight, kg), minimum (Min), maximum (Max), and mean length (standard length, cm). Taxonomic arrangement and scientific names are of Eschmeyer and Herald (1998) and Allen (2005).

Taxon/Species	Common Name	<i>n</i>	BM	Length		
				Min	Max	Mean
RAJIFORMES ^a						
Rajidae						
<i>Raja inornata</i>	California skate	4	5.6	36	53	44
MYLIOBATIFORMES ^a						
Urolophidae						
<i>Urobatis halleri</i>	round stingray	3	1.7	32	38	36
AULOPIFORMES						
Synodontidae						
<i>Synodus lucioceps</i>	California lizardfish	625	15.1	8	29	14
OPHIDIIFORMES						
Ophidiidae						
<i>Chilara taylori</i>	spotted cusk-eel	12	0.9	8	20	16
<i>Ophidion scrippsae</i>	basketweave cusk-eel	1	0.1	16	16	16
BATRACHOIDIFORMES						
Batrachoididae						
<i>Porichthys notatus</i>	plainfin midshipman	22	1.9	5	27	14
SYNGNATHIFORMES						
Syngnathidae						
<i>Syngnathus californiensis</i>	kelp pipefish	5	0.4	13	25	21
SCORPAENIFORMES						
Scorpaenidae						
<i>Scorpaena guttata</i>	California scorpionfish	9	2.4	14	19	17
<i>Seabastes cartinus</i>	copper rockfish	2	0.1	5	5	5
<i>Sebastes elongatus</i>	greenstriped rockfish	1	0.1	4	4	4
<i>Sebastes miniatus</i>	vermilion rockfish	1	0.1	8	8	8
Hexagrammidae						
<i>Zaniolepis latipinnis</i>	longspine combfish	158	4.1	7	18	13
Cottidae						
<i>Chitonotus pugetensis</i>	roughback sculpin	117	3.5	5	12	10
<i>Icelinus quadriseriatus</i>	yellowchin sculpin	158	2.0	3	10	7
<i>Icelinus tenuis</i>	spotfin sculpin	2	0.1	7	7	7
<i>Leptocottus amatus</i>	Pacific staghorn sculpin	2	0.3	15	16	16
Agonidae						
<i>Odontopyxis trispinosa</i>	pygmy poacher	14	0.8	5	9	7
PERCIFORMES						
Sciaenidae						
<i>Genyonemus lineatus</i>	white croaker	82	4.1	8	22	12
Embiotocidae						
<i>Cymatogaster aggregata</i>	shiner perch	20	0.8	7	10	9
Bathymasteridae						
<i>Rathbunella hypoplecta</i>	bluebanded ronquil	1	0.1	11	11	11
Stromateidae						
<i>Peprilus simillimus</i>	Pacific pompano	2	0.2	8	11	10

^aLength measured as total length, not standard length (see text).

Appendix E.1 *continued*

Taxon/Species	Common Name	<i>n</i>	BM	Length		
				Min	Max	Mean
PLEURONECTIFORMES						
Paralichthyidae						
<i>Citharichthys sordidus</i>	Pacific sanddab	5	2.5	4	21	9
<i>Citharichthys stigmaeus</i>	speckled sanddab	3319	37.5	3	14	8
<i>Citharichthys xanthostigma</i>	longfin sanddab	97	9.9	9	20	14
<i>Hippoglossina stomata</i>	bigmouth sole	1	0.2	21	21	21
<i>Paralichthys californicus</i>	California halibut	8	13.1	30	67	40
<i>Xystreurys liolepis</i>	fantail sole	8	1.5	6	30	15
Pleuronectidae						
<i>Parophrys vetulus</i>	English sole	90	5.6	1	26	13
<i>Pleuronichthys decurrens</i>	curlfin sole	23	2.4	6	19	15
<i>Pleuronichthys ritteri</i>	spotted turbot	13	2.1	7	23	15
<i>Pleuronichthys verticalis</i>	hornyhead turbot	148	9.4	3	25	12
Cynoglossidae						
<i>Symphurus atricaudus</i>	California tonguefish	102	2.3	5	15	13

Appendix E.2

Summary of total abundance by species and station for demersal fish at SBOO trawl stations during 2011.

Name	January 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
California lizardfish	4	27		18	164	86	18	317
Speckled sanddab	62	12	18	6	45	71	40	254
White croaker			4	9	24	23		60
California tonguefish			2		3	4	13	22
Shiner perch		1	3	2	10	4		20
English sole		11		1	1	3	1	17
Hornyhead turbot	1	2	2	1	5	5	1	17
Longfin sanddab							15	15
Longspine combfish		1	1	6	2	1	4	15
Roughback sculpin	2	2	1	1		2	2	10
Kelp pipefish	1	1			2	1		5
California halibut		1		2	1			4
Plainfin midshipman	1					2	1	4
Fantail sole				1	1			2
Pacific pompano			1		1			2
Pygmy poacher			1			1		2
Yellowchin sculpin	1						1	2
Basketweave cusk-eel						1		1
California skate					1			1
Curlfin sole	1							1
Quarter Total	73	58	33	47	260	204	96	771

Appendix E.2 *continued*

Name	April 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	252	63	175	165	108	146	89	998
California lizardfish		34	22	6	21	6	1	90
Roughback sculpin	5	10	15	2	2	29	3	66
Longspine combfish	2	5	1	1	10	30	3	52
Yellowchin sculpin		1	11	8	11	3	6	40
Hornyhead turbot	2	9	3	4	3	5	7	33
California tonguefish		1	2	3	3	3	14	26
English sole	2	3	5	4		3		17
Longfin sanddab			6	4	1	2	2	15
Plainfin midshipman		1	1	3				5
Spotted cusk-eel		1		1	3			5
Curlfin sole	3	1						4
Round stingray							3	3
California halibut			1	1				2
Fantail sole				2				2
Bluebanded ronquil			1					1
California scorpionfish			1					1
California skate							1	1
Greenstriped rockfish	1							1
Pygmy poacher				1				1
Quarter Total	267	129	244	205	162	227	129	1363

Appendix E.2 *continued*

Name	July 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	353	97	173	153	81	87	26	970
California lizardfish	15	9	10	10	12	6	75	137
Yellowchin sculpin		2	22	4	23	22	5	78
Longspine combfish							79	79
Hornyhead turbot	8	10	4	11	5	5	3	46
English sole	1	5	2		1	4	6	19
White croaker							22	22
Longfin sanddab		4	1		3	1	8	17
Roughback sculpin	4				2	1	5	12
California tonguefish	2			2	1		6	11
Curlfin sole	2	1	5	2				10
California scorpionfish			1	3		1	2	7
Pacific sanddab	5							5
Spotted cusk-eel	2					1	1	4
Pygmy poacher							3	3
Spotted turbot		2		1				3
Spotfin sculpin					2			2
California halibut		1						1
California skate				1				1
Vermilion rockfish							1	1
Plainfin midshipman							1	1
Quarter Total	392	131	218	187	130	128	243	1429

Appendix E.2 *continued*

NAME	October 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	269	173	160	144	116	125	110	1097
California lizardfish	4	13	13	15	12	10	14	81
Hornyhead turbot	5	11	9	10	7	4	6	52
Longfin sanddab		2	22	3	12	4	7	50
California tonguefish	2	5	3	6	9	5	13	43
Yellowchin sculpin	3	10	18				7	38
English sole		5		1	11	13	7	37
Roughback sculpin	3	6	1		3	7	9	29
Longspine combfish		3			7	1	1	12
Plainfin midshipman		2			1	2	7	12
Spotted turbot	5			2			3	10
Curlfin sole			2	5		1		8
Pygmy poacher		2	2	2			2	8
Fantail sole		2	1	1				4
Spotted cusk-eel		1			1		1	3
Copper rockfish							2	2
Pacific staghorn sculpin	1					1		2
Bigmouth sole			1					1
California halibut							1	1
California scorpionfish					1			1
California skate	1							1
Quarter Total	293	235	232	189	180	173	190	1492
Annual Total	1025	553	727	628	732	732	633	5055

Appendix E.3

Summary of biomass (kg) by species and station for demersal fish at SBOO trawl stations during 2011.

Name	January 2011							Species Biomass by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
California halibut		2.0		8.0	0.4			10.4
California lizardfish	0.2	0.5		0.3	2.9	1.2	0.2	5.3
Speckled sanddab	0.6	0.3	0.4	0.1	0.7	0.6	0.4	3.1
White croaker			0.2	0.4	1.0	0.5		2.1
Hornyhead turbot	0.2	0.1	0.1	0.1	0.2	0.4	0.1	1.2
California skate					1.1			1.1
English sole		0.2		0.1	0.3	0.1	0.1	0.8
Longspine combfish		0.1	0.1	0.3	0.1	0.1	0.1	0.8
Shiner perch		0.1	0.1	0.1	0.4	0.1		0.8
Fantail sole				0.6	0.1			0.7
Longfin sanddab							0.6	0.6
Roughback sculpin	0.1	0.1	0.1	0.1		0.1	0.1	0.6
California tonguefish			0.1		0.1	0.1	0.1	0.4
Kelp pipefish	0.1	0.1			0.1	0.1		0.4
Plainfin midshipman	0.1					0.1	0.1	0.3
Pacific pompano			0.1		0.1			0.2
Pygmy poacher			0.1			0.1		0.2
Yellowchin sculpin	0.1						0.1	0.2
Basketweave cusk-eel						0.1		0.1
Curlfin sole	0.1							0.1
Quarter Total	1.5	3.5	1.3	10.1	7.5	3.6	1.9	29.4

Appendix E.3 *continued*

Name	April 2011							Species Biomass by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	1.7	0.9	2.5	2.5	0.8	1.8	0.7	10.9
Longfin sanddab			2.5	0.3	0.1	0.2	0.1	3.2
Round stingray							1.7	1.7
English sole	0.2	0.1	1.0	0.2		0.1		1.6
Roughback sculpin	0.1	0.2	0.5	0.1	0.1	0.5	0.1	1.6
California lizardfish		0.5	0.3	0.1	0.2	0.4	0.1	1.6
California halibut			1.0	0.4				1.4
Hornyhead turbot	0.1	0.4	0.1	0.2	0.1	0.2	0.3	1.4
Longspine combfish	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.8
California tonguefish		0.1	0.1	0.1	0.1	0.1	0.1	0.6
Yellowchin sculpin		0.1	0.1	0.1	0.1	0.1	0.1	0.6
California skate							0.4	0.4
Plainfin midshipman		0.1	0.1	0.1				0.3
Spotted cusk-eel		0.1		0.1	0.1			0.3
Curlfin sole	0.1	0.1						0.2
Bluebanded ronquil			0.1					0.1
California scorpionfish			0.1					0.1
Fantail sole				0.1				0.1
Greenstriped rockfish	0.1							0.1
Pygmy poacher				0.1				0.1
Quarter Total	2.4	2.7	8.5	4.5	1.8	3.5	3.7	27.1

Appendix E.3 *continued*

Name	July 2011							Species Biomass by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	5.6	2.0	1.3	1.5	1.3	1.2	0.3	13.2
California lizardfish	0.4	0.3	0.1	0.3	0.2	0.3	2.8	4.4
Hornyhead turbot	0.4	0.7	0.2	0.4	0.4	0.7	0.1	2.9
Longspine combfish							2.0	2.0
White croaker							2.0	2.0
California scorpionfish			0.1	0.8		0.2	0.8	1.9
English sole	0.1	0.5	0.1		0.1	0.2	0.6	1.6
Longfin sanddab		0.4	0.1		0.3	0.1	0.3	1.2
Curlfin sole	0.1	0.1	0.5	0.3				1.0
Pacific sanddab	0.7							0.7
Yellowchin sculpin		0.1	0.1	0.1	0.2	0.1	0.1	0.7
Spotted turbot		0.5		0.1				0.6
California skate				0.6				0.6
California halibut		0.4						0.4
California tonguefish	0.1			0.1	0.1		0.1	0.4
Roughback sculpin	0.1				0.1	0.1	0.1	0.4
Spotted cusk-eel	0.1					0.1	0.1	0.3
Plainfin midshipman							0.1	0.1
Pygmy poacher							0.1	0.1
Spotfin sculpin					0.1			0.1
Vermilion rockfish							0.1	0.1
Quarter Total	7.6	5.0	2.5	4.2	2.8	3.0	9.6	34.7

Appendix E.3 *continued*

Name	October 2011							Species Biomass by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
Speckled sanddab	2.5	2.1	2.2	1.5	1.4	1.4	1	12.1
Longfin sanddab		0.1	2.5	0.5	0.8	0.5	0.5	4.9
Hornyhead turbot	0.4	0.5	1	0.6	0.6	0.3	0.5	3.9
California lizardfish	0.3	0.6	0.7	0.8	0.6	0.3	0.5	3.8
California skate	3.5							3.5
English sole		0.4		0.1	0.4	0.4	0.3	1.6
Spotted turbot	0.5			0.6			0.4	1.5
Plainfin midshipman		0.4			0.1	0.1	0.6	1.2
Curlfin sole			0.4	0.5		0.2		1.1
California tonguefish	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.9
Roughback sculpin	0.1	0.2	0.1		0.1	0.2	0.2	0.9
California halibut							0.9	0.9
Fantail sole		0.5	0.1	0.1				0.7
Longspine combfish		0.2			0.1	0.1	0.1	0.5
Yellowchin sculpin	0.1	0.1	0.2				0.1	0.5
California scorpionfish					0.4			0.4
Pygmy poacher		0.1	0.1	0.1			0.1	0.4
Pacific staghorn sculpin	0.1					0.2		0.3
Spotted cusk-eel		0.1			0.1		0.1	0.3
Bigmouth sole			0.2					0.2
Copper rockfish							0.1	0.1
Quarter Total	7.6	5.4	7.6	4.9	4.8	3.8	5.6	39.7
Annual total	19.1	16.6	19.9	23.7	16.9	13.9	20.8	130.9

Appendix E.4

SBOO two-way crossed ANOSIM (no replicates) results for fish (A = stations, B = years).

Global Test: Factor A

Tests for differences between stations (across all years)

Sample statistic (Rho):	0.422
Significance level of sample statistic:	0.01%
Number of permutations:	9999
Number of permuted statistics greater than or equal to Rho:	0

Global Test: Factor B

Tests for differences between years (across all stations)

Sample statistic (Rho):	0.473
Significance level of sample statistic:	0.01%
Number of permutations:	9999
Number of permuted statistics greater than or equal to Rho:	0

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Appendix E.5

List of megabenthic invertebrate taxa captured during 2011 at SBOO trawl stations. Data are number of individuals (*n*). Taxonomic arrangement from SCAMIT (2011).

Taxon/ Species	<i>n</i>
CNIDARIA	
ANTHOZOA	
PENNATULACEA	
Virgulariidae	
<i>Stylatula elongata</i>	1
MOLLUSCA	
GASTROPODA	
Calliostomatidae	
<i>Calliostoma canaliculatum</i>	2
<i>Calliostoma tricolor</i>	2
Turbinidae	
<i>Megastraea undosa</i>	1
HYPSOGASTROPODA	
Naticidae	
<i>Euspira lewisii</i>	2
<i>Sinum scopulosum</i>	1
Bursidae	
<i>Crossata californica</i>	4
Buccinidae	
<i>Kelletia kelletii</i>	16
Nassariidae	
<i>Caesia perpinguis</i>	17
Muricidae	
<i>Pteropurpura festiva</i>	1
Turridae	
<i>Megasurcula carpenteriana</i>	1
OPISTHOBRANCHIA	
Philineidae	
<i>Philine auriformis</i>	194
Aglajidae	
<i>Aglaja ocelligera</i>	1
Pleurobranchidae	
<i>Pleurobranchaea californica</i>	33
Onchidorididae	
<i>Acanthodoris brunnea</i>	53
<i>Acanthodoris rhodoceras</i>	1
Arminidae	
<i>Armina californica</i>	1
Dendronotidae	
<i>Dendronotus iris</i>	4
Flabellinidae	
<i>Flabellina iodinea</i>	7
CEPHALOPODA	
TEUTHIDA	
Loliginidae	
<i>Doryteuthis opalescens</i>	3

Appendix E.5 *continued*

Taxon/ Species			<i>n</i>
	OCTOPODA		
		Octopodidae	
		<i>Octopus rubescens</i>	30
ANNELIDA			
	POLYCHAETA		
	ACICULATA		
		Aphroditidae	
		<i>Aphrodita armifera</i>	1
		<i>Aphrodita refulgida</i>	1
		<i>Aphrodita</i> sp	1
		Polynoidae	
		<i>Halosydna latior</i>	3
ARTHROPODA			
	MAXILLOPODA		
	PEDUNCULATA		
		Scalpellidae	
		<i>Hamatoscalpellum californicum</i>	16
	MALACOSTRACA		
	STOMATOPODA		
		Hemisquillidae	
		<i>Hemisquilla californiensis</i>	14
	ISOPODA		
		Cymothoidae	
		<i>Elthusa vulgaris</i>	58
	DECAPODA		
		Penaeidae	
		<i>Farfantepenaeus californiensis</i>	1
		Sicyoniidae	
		<i>Sicyonia ingentis</i>	9
		<i>Sicyonia penicillata</i>	1
		Hippolytidae	
		<i>Heptacarpus palpator</i>	3
		<i>Heptacarpus stimpsoni</i>	12
		<i>Spirontocaris prionota</i>	1
		Pandalidae	
		<i>Pandalus danae</i>	1
		<i>Pandalus platyceros</i>	1
		Crangonidae	
		<i>Crangon alba</i>	9
		<i>Crangon nigromaculata</i>	5
		Diogenidae	
		<i>Paguristes bakeri</i>	1
		<i>Paguristes ulreyi</i>	2
		Paguridae	
		<i>Pagurus armatus</i>	1
		<i>Pagurus spilocarpus</i>	2
		Calappidae	
		<i>Platymera gaudichaudii</i>	7

Appendix E.5 *continued*

Taxon/ Species	<i>n</i>
Leucosiidae	
<i>Randallia ornata</i>	4
Epialtidae	
<i>Pugettia producta</i>	1
Pisinae	
<i>Loxorhynchus crispatus</i>	7
<i>Loxorhynchus grandis</i>	2
Inachidae	
<i>Podochela hemphillii</i>	3
Inachoididae	
<i>Pyromaia tuberculata</i>	33
Parthenopidae	
<i>Heterocrypta occidentalis</i>	37
Cancridae	
<i>Metacarcinus anthonyi</i>	1
<i>Metacarcinus gracilis</i>	104
ECHINODERMATA	
ASTEROIDEA	
PAXILLOSIDA	
Luidiidae	
<i>Luidia armata</i>	6
<i>Luidia foliolata</i>	29
Astropectinidae	
<i>Astropecten californicus</i>	626
FORCIPULATIDA	
Asteriidae	
<i>Pisaster brevispinus</i>	9
OPHIUROIDEA	
OPHIURIDA	
Ophiotricidae	
<i>Ophiothrix spiculata</i>	16
Ophiuridae	
<i>Ophiura luetkenii</i>	275
ECHINOIDEA	
CAMARODONTA	
Toxopneustidae	
<i>Lytechinus pictus</i>	7
Strongylocentrotidae	
<i>Strongylocentrotus purpuratus</i>	1
CLYPEASTEROIDA	
Dendrasteridae	
<i>Dendraster terminalis</i>	125

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Appendix E.6

Summary of total abundance by species and station for megabenthic invertebrates at the SBOO trawl stations during 2011.

Name	January 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
<i>Astropecten californicus</i>	100	6	20	13	20	12	1	172
<i>Philine auriformis</i>				1	20	6	79	106
<i>Metacarcinus gracilis</i>			24		1	6	2	33
<i>Acanthodoris brunnea</i>		3	1	2	7	1	1	15
<i>Dendraster terminalis</i>	4		2					6
<i>Elthusa vulgaris</i>					6			6
<i>Octopus rubescens</i>		2	1	1	1	1		6
<i>Ophiura luetkenii</i>			1	5				6
<i>Crangon nigromaculata</i>					3	1		4
<i>Doryteuthis opalescens</i>						3		3
<i>Kelletia kellestii</i>			1	2				3
<i>Ophiothrix spiculata</i>		1	2					3
<i>Pleurobranchaea californica</i>					1	1	1	3
<i>Hemisquilla californiensis</i>		1				1		2
<i>Luidia armata</i>		1		1				2
<i>Lytechinus pictus</i>		1	1					2
<i>Aphrodita armifera</i>					1			1
<i>Aphrodita refulgida</i>					1			1
<i>Aphrodita sp</i>						1		1
<i>Crangon alba</i>	1							1
<i>Crossata californica</i>	1							1
<i>Farfantepenaeus californiensis</i>			1					1
<i>Flabellina iodinea</i>		1						1
<i>Halosydna latior</i>			1					1
<i>Pisaster brevispinus</i>							1	1
<i>Pyromaia tuberculata</i>	1							1
<i>Sicyonia ingentis</i>							1	1
<i>Sicyonia penicillata</i>							1	1
Quarter Total	107	16	55	25	61	33	87	384

Appendix E.6 *continued*

Name	April 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
<i>Ophiura luetkenii</i>			150	50	2			202
<i>Astropecten californicus</i>	30	15	37	7	11	27	5	132
<i>Dendraster terminalis</i>	89							89
<i>Philine auriformis</i>			2	6	28	1	32	69
<i>Metacarcinus gracilis</i>		5	2	4	1	1	6	19
<i>Pleurobranchaea californica</i>				8	1	5	5	19
<i>Luidia foliolata</i>			12	4	1			17
<i>Elthusa vulgaris</i>	1		1	1	4	5	2	14
<i>Hemisquilla californiensis</i>		4	1	2	1	2	1	11
<i>Acanthodoris brunnea</i>			6	3			1	10
<i>Pyromaia tuberculata</i>	8				1		1	10
<i>Crangon alba</i>	4						2	6
<i>Dendronotus iris</i>			1			3		4
<i>Flabellina iodinea</i>			3			1		4
<i>Octopus rubescens</i>	2	1					1	4
<i>Sicyonia ingentis</i>							4	4
<i>Kelletia kelletii</i>		1				1	1	3
<i>Euspira lewisii</i>							2	2
<i>Halosydna latior</i>				1		1		2
<i>Platymera gaudichaudii</i>			1		1			2
<i>Aglaja ocelligera</i>			1					1
<i>Armina californica</i>			1					1
<i>Calliostoma canaliculatum</i>	1							1
<i>Crossata californica</i>	1							1
<i>Luidia armata</i>				1				1
<i>Paguristes bakeri</i>				1				1
<i>Pagurus spilocarpus</i>			1					1
<i>Pandalus danae</i>						1		1
<i>Pisaster brevispinus</i>	1							1
<i>Podochela hemphillii</i>	1							1
<i>Randallia ornata</i>		1						1
<i>Sinum scopulosum</i>	1							1
<i>Strongylocentrotus purpuratus</i>				1				1
Quarter Total	139	27	219	89	51	48	63	636

Appendix E.6 *continued*

Name	July 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
<i>Astropecten californicus</i>	108	10	15	4	7	8	11	163
<i>Dendraster terminalis</i>	28							28
<i>Heterocrypta occidentalis</i>			2	10	7	3		22
<i>Elthusa vulgaris</i>	4	1	1	4	5	1	3	19
<i>Philine auriformis</i>			3	3			12	18
<i>Acanthodoris brunnea</i>			11	6				17
<i>Hamatoscalpellum californicum</i>			13	3				16
<i>Metacarcinus gracilis</i>		14	1			1		16
<i>Pyromaia tuberculata</i>			6	6	2		2	16
<i>Ophiura luetkenii</i>			3	11			1	15
<i>Heptacarpus stimpsoni</i>							12	12
<i>Luidia foliolata</i>		1	1	1			8	11
<i>Loxorhynchus crispatus</i>	1	1	1	1	1	2		7
<i>Ophiothrix spiculata</i>			1	4			2	7
<i>Pleurobranchaea californica</i>		1	1	1	1		1	5
<i>Octopus rubescens</i>		2				1	1	4
<i>Kelletia kelletii</i>		1				2		3
<i>Calliostoma tricolor</i>							2	2
<i>Crangon alba</i>	2							2
<i>Heptacarpus palpator</i>							2	2
<i>Platymera gaudichaudii</i>	1				1			2
<i>Podochela hemphillii</i>			2					2
<i>Randallia ornata</i>		1				1		2
<i>Caesia perpinguis</i>				1				1
<i>Calliostoma canaliculatum</i>							1	1
<i>Flabellina iodinea</i>			1					1
<i>Loxorhynchus grandis</i>							1	1
<i>Luidia armata</i>		1						1
<i>Megasurcula carpenteriana</i>							1	1
<i>Paguristes ulreyi</i>		1						1
<i>Pagurus armatus</i>			1					1
<i>Pandalus platyceros</i>							1	1
<i>Pisaster brevispinus</i>						1		1
<i>Sicyonia ingentis</i>							1	1
<i>Stylatula elongata</i>				1				1
Quarter Total	144	34	63	56	24	20	62	403

Appendix E.6 *continued*

Name	October 2011							Species Abundance by Survey
	SD15	SD16	SD17	SD18	SD19	SD20	SD21	
<i>Astropecten californicus</i>	111	27	4		2	10	5	159
<i>Ophiura luetkenii</i>			23	24	5			52
<i>Metacarcinus gracilis</i>	1	6	14			9	6	36
<i>Elthusa vulgaris</i>	2	1	2	3	5	5	1	19
<i>Caesia perpinguis</i>	1			14	1			16
<i>Octopus rubescens</i>					6	4	6	16
<i>Heterocrypta occidentalis</i>		1		6			8	15
<i>Acanthodoris brunnea</i>			5	4	1		1	11
<i>Kelletia kelletii</i>		1	1	2		2	1	7
<i>Ophiothrix spiculata</i>	1	1			2		2	6
<i>Pisaster brevispinus</i>	4		1		1			6
<i>Pleurobranchaea californica</i>					4	2		6
<i>Pyromaia tuberculata</i>		1		4		1		6
<i>Lytechinus pictus</i>	1			4				5
<i>Platymera gaudichaudii</i>		1	1	1				3
<i>Sicyonia ingentis</i>							3	3
<i>Crossata californica</i>		1		1				2
<i>Dendraster terminalis</i>	2							2
<i>Luidia armata</i>		2						2
<i>Acanthodoris rhodoceras</i>						1		1
<i>Crangon nigromaculata</i>		1						1
<i>Flabellina iodinea</i>			1					1
<i>Hemisquilla californiensis</i>		1						1
<i>Heptacarpus palpator</i>							1	1
<i>Loxorhynchus grandis</i>				1				1
<i>Luidia foliolata</i>		1						1
<i>Megastraea undosa</i>		1						1
<i>Metacarcinus anthonyi</i>			1					1
<i>Paguristes ulreyi</i>		1						1
<i>Pagurus spilocarpus</i>					1			1
<i>Philine auriformis</i>			1					1
<i>Pteropurpura festiva</i>							1	1
<i>Pugettia producta</i>						1		1
<i>Randallia ornata</i>		1						1
<i>Spirontocaris prionota</i>							1	1
Quarter Total	123	48	54	64	28	35	36	388
Annular Total	513	125	391	234	164	136	248	1811